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Original Great Magnitude of Our Coal Measures

Charles R. Keyes

The Iowa section, therefore, does not indicate the real stratigraphic significance of the Dakota beds, for, from outcrops elsewhere, it is known to be a true basal sandstone. Neither do the Iowa sections give any suggestion of the Dakota's broader stratigraphic relationships, since, singularly, this sandstone appears to extend unbrokenly from Iowa to Nevada, and from Mexico to Canada. Throughout its range it constitutes the basal lining of the broad Cordilleran, or Rocky Mountain, geosyncline, with three miles of stratigraphic interval between its deepest occurrence and its highest elevation as an old strand-line. It is not, in fact, a really good geological formation, in the commonly accepted meaning of that term, inasmuch as it is of different geological ages at different places. For such a basal sandstone the title *Basilium* is suggested, the diminutive of base, in contradistinction of the great basement complex beneath all.

DES MOINES, IOWA.

ORIGINAL GREAT MAGNITUDE OF OUR COAL MEASURES

CHARLES R. KEYES

Recent diastatic analyses of our Des Moines coal measures, particularly of the great Arkansan centrum, or delta, of which the Iowa coal measures are a part, after the paradigm of the Cordilleran Cretacic geosyncline, indicate that only a relatively small proportion of the original deposition of coal-bearing beds now remain to us. Present thickness of the Iowa coal measures is perhaps 300 to 400 feet. In the beginning, the volume appears to have been more than four miles thick. The vast missing bulk was removed through erosion, mainly regional planation before the great Missourian series of limestones was laid down.

The Des Moines series itself thus becomes an exact cyclic counter-part of its Cretacic analogue. There is the same broad down-sinking of the initial, or basal peneplane, to serve as a quantitative directrix in measurement of the magnitude of the geosynclinal depression and the extent of the diastrophic movements; there is the same prodigious infilling of the geosynclinal trough by fine sediments, with accompanying shore accumulations of vegetation, later to form coals, until, as said, the coal measures attained

the enormous thickness such as might be little suspected from inspection of the present day Iowa field alone; there is a like notable metamorphism of the sediments while in the depths, with an accompaniment of extensive batholithic intrusions of granite; there is then a marked epeirogenic uplifting, and beltic folding, out in the middle of the geosyncline, in present Nebraska, Kansas, and Oklahoma, which orogenics is commonly designated as the buried Nemaha mountains; there is further, a complete razing of the old elevations that rose in their day as majestically perhaps above the general plains-surface as do the Rocky Mountains in our day above the Colorado plain.

Great as our Coal Measures seem to us today, they were, in the beginning, a hundred-fold greater.

DES MOINES, IOWA.

NEW MAPPING OF GEOLOGICAL BOUNDARIES OF NORTHWEST IOWA

A. C. TESTER

The existing geological maps of Iowa show a continuous blanket of Cretaceous rocks underlying the glacial drift of northwest Iowa. Previous workers have recognized that the Cretaceous was not continuous under the drift and might have a very irregular distribution along the borders as mapped. As a result of over two years of extensive sub-surface studies, assisted during the last nine months by H. G. Hershey, considerable revision of the boundaries of the Cretaceous has been made.

In the preparation of the new geological map of Iowa now in press a review was made of the literature and well records, and the available samples were studied and every effort was made to differentiate the formations and map them according to these data. Three major areas of the Cretaceous are recognized, namely, the southwestern, the west-central, and northwestern. In the first the Cretaceous is composed entirely of lower Dakota sandstone and some of the middle shale member; the west-central area is nearly the same but includes in some parts the upper sandstone; the northwestern area is mapped as "Cretaceous undifferentiated" as it is known to include in some parts beds of the Carlile shale and